

REMARKS

Applicant thanks the Examiner for carefully considering the present application. Please reconsider the present application in view of the above amendments and the following remarks.

Disposition of Claims

Claims 1-21 were pending in the present application. Claims 5-21 have been canceled by way of this reply. New claims 22-24 have been added. Thus, claims 1-4 and 22-24 are now pending in the present application. Claims 1 and 22-24 are independent. Claims 2-5 depend, either directly or indirectly, from claim 1.

Amendments to the Claims

Claims 1 and 3 have been amended by way of this reply. Claim 1 has been amended to correct grammatical and typographical errors. The amendment to line 10 of claim 1 canceling the term "includes" had been made in the preliminary amendment filed January 28, 2005, but unlike the other amendments made in the preliminary amendment, was not reflected in the publication of the present application. Thus, Applicant resubmits the amendment. Claim 3 has been amended to remove the term "about" to remove indefiniteness. New claims 22-24 have been added. Support for new claims 22-24 can be found, for example, in Fig. 1 and the originally filed claims. No new matter has been added by way of the amendments.

Objections to the Drawings

The Examiner objected to the drawings, asserting that the angle of the apex of the frustoconical segment is not clearly shown. Applicant respectfully traverses the objection. Applicant submits that one of ordinary skill in the art would easily ascertain from the figures that the angle of the apex of the frustoconical segment is the angle that is formed by extending the sloped sides of the frustoconical segment until they meet. Further, the Examiner objected to the drawings, asserting that the angle does not appear to be substantially 40 degrees. Claims 5 and 14 have been canceled without prejudice or disclaimer. Accordingly, withdrawal of the objection is respectfully requested.

Rejections Under 35 U.S.C. § 112

Claims 3, 7, 13, 16, and 19-21 of the present application were rejected under U.S.C. § 112, second paragraph, as being indefinite. Claim 3 has been amended to remove the term "about." Claims 7, 13, 16, and 19-21 have been canceled. Accordingly, withdrawal of the rejection is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 1-5, 8-14, and 17-21 of the present application were rejected under U.S.C. § 102 (b) as being anticipated by PCT Application Publication No. WO 99/57465 ("Merminod"). Claims 5, 8-14, and 17-21 have been canceled. Claims 1 and 3 have been amended by way of this reply. To the extent that the rejection may still apply to the amended claims, this rejection is respectfully traversed.

Merminod discloses an electromagnetic valve for gaseous fluids having a simple wear resistant valve with a short response time. The electromagnetic valve of Merminod has a disc formed member 17 that rests against a valve seat 24 in a closed position, and that lifts away from the valve seat 17 when in open position. Merminod also discloses a passage 23 whose sectional area is precisely defined in order to get a sonic flow of the gaseous fluid through the passage 23.

Claims 1 requires, in part, "a calibrated segment of having a cross-sectional area smaller than the fuel flow section defined by the valve member when the valve member is in the open position."

The Examiner asserts that Fig. 1 of Merminod discloses the above limitations. However, Fig. 1 of Merminod lacks clarity and the details of the valve member are not precisely represented. The proportions of the cross-sectional areas of segment and of the seat of the valve member cannot be deduced from Fig. 1. Furthermore, Fig. 1 shows the valve member in its closed position such that the stroke of the valve member cannot be inferred from Fig. 1. Thus, Fig. 1, and the remainder of Merminod, fails to show or suggest at least the above limitations.

In view of the above, claim 1 is patentable over Merminod, at least for the above reasons. Claims 2-4 are dependent, either directly or indirectly, from claim 1. Thus, claims 2-4 are patentable over Merminod, for at least the same reasons as claim 1. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 1-21 of the present application were rejected under U.S.C. § 102 (b) as being anticipated by U.S. Patent Application No. 5,080,288 ("Shen"). Claims 5-21 have been

canceled. Claims 1 and 3 have been amended by way of this reply. To the extent that the rejection may still apply to the amended claims, this rejection is respectfully traversed.

Shen discloses a fuel injection nozzle for supplying liquid fuel to the air inlet duct of a spark ignition engine, having a valve member movable from a closed position to an open position, wherein in the open position liquid fuel flows from a nozzle inlet to a nozzle outlet. At the nozzle outlet, the liquid fuel is atomized.

Claim 1 requires, in part, that "a calibrated segment of having a cross-sectional area smaller than the fuel flow section defined by the valve member when the valve member is in the open position."

There is nothing in Shen that would teach or suggest the cross-sectional area of the calibrated segment being smaller than the fuel flow section defined by the valve member when the valve member is in the open position. The fuel flow section is defined in the specification of the present invention as the product of the circumference of the opening multiplied by the distance between the edge of the opening and the valve member. Nothing in Shen indicates the distance of the opening of the valve member. Thus, without the explicit disclosure of the above limitations, it should be assumed that the central orifice 14 of Shen has a cross-sectional area equal to the fuel flow section defined by the valve member when the valve member is in the open position, as is generally the case for liquid fuel, since liquid fuel is substantially incompressible. Because liquid fuel is substantially incompressible, there are no pressure variations susceptible to produce changes in the flow rate, as is the case the gaseous fuel injector of the claimed invention. Thus, the above-quoted limitation of claim 1 would be unnecessary in the Shen device. Accordingly, a person of ordinary skill in the art, recognizing

the significant design differences between gaseous and liquid fuel injectors, would not look to Shen for teachings relative to design of a gaseous fuel injector.

In view of the above, claim 1 is patentable over Shen, at least for the above reasons. Claims 2-4 are dependent, either directly or indirectly, from claim 1. Thus, claims 2-4 are patentable over Shen, at least for the same reasons as claim 1. Accordingly, withdrawal of the rejection is respectfully requested.

New Claims

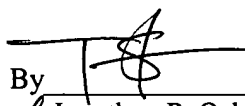
New claims 22-24 have been added in this reply. Claims 22-24 include the limitations argued above as not shown or suggested by the cited prior art with respect to claim 1. Accordingly, new claims 22-24 are also allowable for at least the same reasons as those set forth above regarding claim 1. Thus, entry and favorable consideration is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places the present application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account No. 50-0591, under Order No. 17286/002001 from which the undersigned is authorized to draw.

Dated: February 23, 2007

Respectfully submitted,

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